

CLAIMS

- 1 1. A system comprising:
 - 2 a charge-emission device having an emitter; and
 - 3 a controllable current source electrically connected to the emitter
 - 4 of the charge-emission device by an electrical path, the controllable
 - 5 current source supplying to the emitter of the charge-emission device
 - 6 over the electrical path a controlled amount of electrical current that
 - 7 produces a potential difference at the emitter with respect to an electrode
 - 8 to induce the emitter to emit electrical charge.
- 9 2. The system of claim 1, further comprising a current sink connected to
- 10 the controllable current source for shunting at least a portion of the
- 11 electrical current to ground upon a detection of a particular charge
- 12 emission condition.
- 1 3. The system of claim 2, further comprising protection circuitry for
- 2 detecting the particular charge emission condition and for activating the
- 3 current sink upon the detection.
- 1 4. The system of claim 2, wherein the particular charge emission condition
- 2 is indicative of an excessive flow of current from the emitter.

- 1 5. The system of claim 2, wherein the particular charge emission condition
- 2 is indicative of an excessive rate of change of the current flowing from the
- 3 emitter.

- 1 6. The system of claim 1, wherein the current source is adjustable to enable
- 2 changes to an amount of electrical current being supplied by the
- 3 controllable current source to the emitter.

- 1 7. The system of claim 1, further comprising a controller directing the
- 2 controllable current source to provide a predetermined amount of
- 3 electrical current.

- 1 8. The system of claim 1, wherein the charge-emission device is a device
- 2 that emits ions.

- 1 9. The system of claim 8, wherein the emitted ions have a positive charge.

- 1 10. The system of claim 1, wherein the charge-emission device is a device
- 2 that emits electrons.

- 1 11. The system of claim 1, wherein the charge-emission device emits fluid.

- 1 12. The system of claim 1, wherein the charge-emission device is a gated
- 2 device.

- 1 13. The system of claim 1, wherein the charge-emission device has an array
- 2 of emitters including the emitter and a second emitter, and the

3 controllable current source provides current to each emitter in the
4 emitter array.

1 14. The system of claim 1, wherein the controllable current source is a first
2 current source, the charge-emission device has an array of emitters
3 including a first emitter and a second emitter, and further comprising a
4 second controllable current source, the first current source supplying a
5 first controlled amount of electrical current to the first emitter and the
6 second current source supplying a second controlled amount of current
7 to the second emitter.

1 15. A system comprising:
2 a micro-fabricated charge-emission device having an emitter; and
3 controllable means for supplying to the emitter of the charge-
4 emission device a controlled amount of electrical current that produces a
5 potential difference at the emitter with respect to an electrode to induce
6 the emitter to emit electrical charge.

1 16. The system of claim 15, further comprising means for signaling the
2 supplying means to supply the controlled amount of electrical current.

1 17. The system of claim 15, further comprising means for adjusting the
2 controlled amount of electrical current supplied to the emitter.

- 1 18. The system of claim 15, further comprising means for shunting at least a
- 2 portion of the supplied electrical current to ground upon a detection of a
- 3 particular condition.
- 1 19. The system of claim 15, further comprising means for detecting a
- 2 particular charge emission condition.
- 1 20. A method of controlling an amount of charge emitted by a charge-
- 2 emission device, the method comprising:
 - 3 supplying a controlled amount of current from a controllable
 - 4 current source to an emitter of a charge-emission device over an
 - 5 electrical path; and
 - 6 emitting charge from the emitter of the charge-emission device in
 - 7 response to the current received from the controllable current source.
- 1 21. The method of claim 20, further comprising adjusting the amount of
- 2 electrical current supplied to the emitter by the controlled current
- 3 source.
- 1 22. The method of claim 20, further comprising shunting the current
- 2 supplied by the controlled current source to ground upon a detection of a
- 3 particular charge emission condition.

- 1 23. The method of claim 20, further comprising shunting the supplied
- 2 current in response to detecting an excessive rate of change in an
- 3 amount of charge being emitted by the emitter.

- 1 24. The method of claim 20, further comprising shunting the supplied
- 2 electrical current in response to detecting an excessive amount of charge
- 3 being emitted by the emitter.